Fishery Management Report No. 10-08

Southeastern District Mainland (Alaska Peninsula Area) Salmon Management Plan, 2010

by

Alex C. Bernard

March 2010

Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheries**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Measures (fisheries)

fork length	FL
mideye to fork	MEF
mideye to tail fork	METF
standard length	SL
total length	TL

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	*e*
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	*E*
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

FISHERY MANAGEMENT REPORT NO. 10-08

SOUTHEASTERN DISTRICT MAINLAND (ALASKA PENINSULA AREA) SALMON MANAGEMENT PLAN, 2010

by
Alex C. Bernard
Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1565

March 2010

The Fishery Management Reports series was established in 1989 by the Division of Sport Fish for the publication of an overview of management activities and goals in a specific geographic area, and became a joint divisional series in 2004 with the Division of Commercial Fisheries. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Fishery Management Reports are available through the Alaska State Library and on the Internet: http://www.sf.adfg.state.ak.us/statewide/divreports/html/intersearch.cfm. This publication has undergone regional peer review.

Alex C. Bernard,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
211 Mission Road, Kodiak, AK 99615, USA

This document should be cited as:
Bernard, A. C. 2010. Southeastern District Mainland (Alaska Peninsula Area) salmon management plan, 2010. Alaska Department of Fish and Game, Fishery Management Report No. 10-08, Anchorage.

TABLE OF CONTENTS

Page

LIST OF TABLES

Table

LIST OF FIGURES

Figure **Page**

LIST OF APPENDICES

Appendix **Page**

ABSTRACT

The Southeastern District Mainland (SEDM) commercial salmon fishery takes place on the south side of the Alaska Peninsula in Stepovak, Balboa, and Beaver bays. This commercial salmon fishery is managed based on three distinct conditions and timeframes: 1) the strength of Chignik River sockeye salmon *Oncorhynchus nerka* stocks during June 1 through July 25, and 2) the strength of Orzinski Lake sockeye salmon in the Northwest Stepovak Section (NWSS) during July 1through July 25, and 3) local pink *O. gorbuscha*, chum *O. keta,* and coho salmon *O. kisutch* stocks from July 26 through the end of the season. The 2010 Chignik early- and late-run forecasted harvest estimates are 730,000 and 857,000 sockeye salmon, respectively. Therefore, fishing time is anticipated in the Southeastern District Mainland. This report summarizes the Southeastern District Mainland Salmon Management Plan and is intended as a guide for commercial salmon harvesters, buyers, transporters, and tenders.

Key words: Southeastern District Mainland, commercial salmon fishery, management plan, Alaska Peninsula Management Area, sockeye salmon, *Oncorhynchus nerka*, chum salmon, *Oncorhynchus keta*, pink salmon, *Oncorhynchus gorbuscha,* coho salmon, *Oncorhynchus kisutch,* SEDM, Area M, CMA, Chignik, forecasts

INTRODUCTION

The purpose of this document is to provide commercial harvesters and processors with information and guidelines that will be used by the Alaska Department of Fish and Game (ADF&G) to manage the Southeastern District Mainland (SEDM) commercial salmon fishery during 2010.

The Southeastern District Mainland fishery takes place on the south side of the Alaska Peninsula and Aleutian Islands Management areas (Area M; Figure 1). The Chignik Management Area (CMA; Area L) lies immediately to the east of SEDM and the South Central District of Area M lies immediately to the west (Figure 1). There are six distinct fishing sections within SEDM: Beaver Bay, Balboa Bay, Southwest Stepovak, Northwest Stepovak, East Stepovak, and Stepovak Flats sections (Figure 2). The *Southeastern District Mainland Salmon Management Plan* (Appendix A1; 5 AAC 09.360) was originally established by the Alaska Board of Fisheries (BOF) in 1980. In 1985, the BOF established the framework of the allocation criteria that SEDM is currently managed on.

The ADF&G will manage the SEDM fishery based on three distinct conditions and timeframes: 1) the strength of Chignik sockeye salmon stocks, 2) the strength of Orzinski Lake sockeye salmon in the Northwest Stepovak Section (NWSS) during July 1 through July 25, and 3) abundance of local sockeye *Oncorhynchus nerka*, coho *O. kisutch*, pink *O. gorbuscha*, and chum *O. keta*, salmon stocks. From June 1 through July 25, June 1 through June 30 in the NWSS, the SEDM fishery is allocated 7.6% of the total CMA sockeye salmon harvest. From July 1 through July 25, NWSS is managed based the strength of sockeye salmon returning to Orzinski Lake. Harvest during the June 1 through July 25 timeframe has ranged from no commercial salmon harvest to over 300,000 sockeye salmon harvested (Table 1). The two terminal harvest areas within the SEDM (Figures 2 and 3) will be managed as specified under the *South Peninsula Post-June Salmon Management Plan* (5 AAC 09.366); additional harvest opportunity may be provided by emergency order in the Suzy Creek terminal area from July 25 through July 31 and in the Stepovak Flats Section from July 26 through July 28. After July 25, the fishery is managed based on the abundance of local pink, chum, and coho salmon stocks.

FISHING PERIODS

The SEDM fishery is managed independently of other fisheries in Area M through July 25. The ADF&G will attempt to have fishing periods in the NWSS and Stepovak Flats Section concurrent

with fishing periods in the remainder of the SEDM area to avoid concentrating fishing gear. During July 1 through 25, salmon fishing in the NWSS, excluding Orzinski Bay, may not exceed four 24-hour periods with no more than 48 hours continuous fishing, during a seven-day period (5 AAC 09.360(e)). However, if the cumulative sockeye salmon escapement through Orzinski Lake weir exceeds 25,000 sockeye salmon, the NWSS and Orzinski Bay sections can be opened concurrently to set gillnet and purse seine gear, and set gillnet gear may be fished continuously in the NWSS and Orzinski Bay (5 AAC 09.360(e)(2)). In this case, seine gear will be restricted to four days per week with no more than two days of continuous fishing (5 AAC 09.360(e)(1)).

All fishing periods will be established by emergency order. A minimum of 24 hours notice will be given prior to the first commercial fishing period of the season. At least 12 hours of advance notice will be given prior to any additional fishing periods, unless the announcement extends a current fishing period.

HARVEST REPORTING

Buyers must provide salmon harvest reports to the ADF&G office in Sand Point by 9:30 AM on the day following the landings (5 AAC 39.130). These salmon harvest reports must include number and pounds of fish by species, number of deliveries by gear type, and statistical area of the harvest. Buyers may phone, e-mail, or fax their reports to the ADF&G office in Sand Point:

Sand Point	Phone: 907-383-2066	Fax: 907-383-2602
Aaron Poetter	E-mail: aaron.poetter@alaska.gov, or	
Alex Bernard	Email: alex.bernard@alaska.gov	
Cold Bay	Phone: 907-532-2419	Fax: 907-532-2470
Matthew Keyse	E-mail: matthew.keyse@alaska.gov	

Fish tickets must be received in the ADF&G's Sand Point office (address provided below) within seven days of the purchase date, unless other arrangements have been made with ADF&G. Mail fish tickets to:

Alaska Department of Fish and Game
P.O. Box 129
Sand Point, AK 99661

INSEASON ANNOUNCEMENTS

Inseason announcements will be broadcast on radio station KSDP AM 830 KHz in Sand Point and rebroadcast over K201DA FM 88.1 MHz in King Cove. Announcements will also be broadcast on marine VHF channels 6 and 73 daily at 9:30 AM and 5:30 PM. The most current fishery announcements may also be obtained by calling the department's recorder phones in Sand Point at 907-383-2334 (383-ADFG) and Cold Bay at 907-532-2419.

During the 2010 season, catches, escapements, and announcements will be available at the Commercial Fisheries website: www.cf.adfg.state.ak.us/region4/rgn4home.php.

2010 MANAGEMENT PLAN

Under the current SEDM Salmon Management Plan (5 AAC 09.360; Appendix A):

1. the percentage of Chignik-bound sockeye salmon allocated to the SEDM fishery is 7.6% of the total number of sockeye salmon harvested in the CMA through July 25;
2. from June 1 through July 25, 80% of the sockeye salmon caught in the SEDM are considered to be Chignik-bound salmon, excluding NWSS after July 1 (Figure 2);
3. beginning July 1, sockeye salmon caught in the NWSS will be considered 100% local fish and not counted toward the Chignik allocation (Figure 2). Fishing time in the NWSS after June 30 will be based on sockeye salmon escapement into Orzinski Lake and may not be more than four 24-hour periods with no more than 48 hours continuous fishing during a seven-day period;
4. if the Orzinski Lake escapement meets or exceeds 25,000 sockeye salmon, the NWSS and Orzinski Bay may be opened as follows;
   (a) set gillnet gear may be operated continuously until MIDNIGHT July 25;
   (b) purse seine and hand purse seine gear may not be operated for more than four 24-hour periods with no more than 48 hours continuous fishing during a seven-day period.
5. the BOF established a closed waters area encompassing Kupreanof Point from July 6 through August 31 (Figure 4; 5 AAC 09.350 (37)). ADF&G may extend the Kupreanof Point closed waters area through the end of the season by emergency order when the waters specified in 5 AAC 15.350 (20) are closed to conserve coho salmon.
6. from July 26 through October 31, the fishery is managed for local pink, chum, and coho salmon stocks;
7. from July 26 through October 31, the fishery will be closed for at least one 36-hour period within a seven-day period; and,
8. additional harvest opportunity may be provided by emergency order in the Suzy Creek terminal area from July 25 through July 31 based on the abundance of local pink salmon stocks and in the Stepovak Flats Section from July 26 through July 28 based on the abundance of local chum salmon stocks (5AAC 09.366 (g)).

NORTHWEST STEPOVAK SECTION

A weir was used to count salmon escapements into Orzinski Lake from 1929 through 1941, and again from 1990 through the present (Poetter et al. 2009). The Orzinski Lake sockeye salmon sustainable escapement goal range is 15,000 to 20,000 adult salmon (Witteveen et al. 2009). Based on aerial surveys and weir counts, ADF&G developed interim sockeye salmon escapement objectives for Orzinski Lake (Figure 5). ADF&G intends to operate a weir on the Orzinski Lake system again in 2010.

Sockeye salmon usually begin entering Orzinski Lake in late June and typically 50% of the annual escapement has been achieved by the second week of July. Generally, the Orzinski Lake sockeye salmon escapement is achieved by the first week of August. However, in 2003 and 2004, there were large buildups of sockeye salmon in Orzinski Bay in late June. This led to

relatively large escapements in early July and contributed to total season escapements over three times the upper goal of 20,000 fish (Poetter et al. 2009).

STEPOVAK FLATS SECTION

The Stepovak Flats Section is open to commercial salmon fishing concurrently with the rest of SEDM. Of the sockeye salmon harvested in the Stepovak Flats Section prior to July 26, 80% are assigned to the 7.6% allocation criteria stated in the current SEDM salmon management plan. From July 26 through July 28, the Stepovak Flats Section may be opened based on the strength of pink and chum salmon runs. The Stepovak Flats Section is closed to all commercial fishing from July 29-October 31 to protect schooling chum salmon.

CHIGNIK RIVER SOCKEYE SALMON FORECAST AND SEDM ALLOCATION

The 2010 Chignik River forecast for the early-run harvest estimate is 730,000 sockeye salmon, and the late-run harvest estimate is 857,000 sockeye salmon (Appendix B1). The ADF&G will manage the fishery so that the number of sockeye salmon harvested in the CMA, for both runs combined, will be at least 600,000 fish and the harvest of sockeye salmon considered to be Chignik bound in the SEDM will approach, as near as possible, 7.6% of the total CMA sockeye salmon harvest through July 25.

From June 26 through July 8, the strength of the Chignik sockeye salmon late-run cannot be accurately evaluated due to the mixing of early- and late-run stocks. During this transition period, the ADF&G may close or restrict commercial salmon fishing in SEDM until the strength of the late run has been determined. After July 8, the SEDM fishery will be managed based on the strength of the Chignik late run and the total Chignik Area sockeye salmon harvest through July 25. After July 8, if the late-run interim escapement objectives are being met in the Chignik Area and the total CMA harvest is at least 300,000 sockeye salmon, SEDM may open to commercial salmon fishing. However, the harvest in SEDM at any time before July 25 may be permitted to fluctuate above or below 7.6% of the Chignik Area harvest (5 AAC 09.360 (g)).

ALASKA BOARD OF FISHERIES REGULATION CHANGES FROM THE FEBRUARY 2010 MEETING

During the February 2010 meeting, the Alaska Board of Fisheries (BOF) made the following minor changes to the *Southeastern District Mainland Salmon Management Plan* (5 AAC 09.360):

1. BOF extended the fishing season from June 1 through October 31.
2. Increase the length of seine lead that can be used with set gillnet gear from 10 fathoms to 25 fathoms. This gear modification will be in effect for the entire salmon fishing season in waters within the South Alaska Peninsula management area.
3. Reduce the minimum set gillnet mesh size allowed in the SEDM after July 25 to four and one half inches.
4. Open the waters of Dorenoi Bay during the entire fishing season.

REFERENCES CITED

Poetter, A. D., M. D Keyse, and A. C. Bernard. 2009. South Alaska Peninsula salmon annual management report, 2009. Alaska Department of Fish and Game, Fishery Management Report No. 09-57, Anchorage.

Witteveen, M., H. Finkle, M. Loewen, M. B. Foster, and J. W. Erickson. 2009. Review of salmon escapement goals in the Alaska Peninsula and Aleutian Islands Management Area; A Report to the Board of Fisheries, 2010. Alaska Department of Fish and Game, Division of Commercial Fisheries, Fishery Manuscript No. 09-09, Anchorage.

TABLES AND FIGURES

Table 1.–Southeastern District Mainland commercial fishing effort and assignment of sockeye salmon harvests during the June 1-July 25period, from 1985-2009.

	Effort				Northwest Stepovak			SEDM minus Northwest Stepovak		SEDM		
	Set gillnet		Seine									Total
Year	Permits	Landings	Permits	Landings	Total	"Local"	"Non-local"	"Local"	"Non-local"	"Local"	"Non-local"	Catch
1985[a]	49	367	23	51	16,681	16,681	0	12,855	51,421	29,536	51,421	80,957
1986	42	616	18	29	59,025	59,025	0	29,501	118,006	88,526	118,006	206,532
1987	53	528	6	9	61,287	61,287	0	36,722	146,886	98,009	146,886	244,895
1988	41	300	16	45	57,010	57,010	0	4,830	19,320	61,840	19,320	81,160
1989	42	248	25	54	83,618	83,618	0	1,121	4,485	84,739	4,485	89,224
1990	46	277	69	131	3,279	3,279	0	32,609	128,599	35,888	128,599	164,487
1991	59	747	39	71	98,834	98,834	0	38,179	152,714	137,013	152,714	289,727
1992[b]	59	650	6	14	113,430	101,198	12,232	20,403	81,613	121,599	93,845	215,444
1993	64	763	53	82	73,747	54,955	18,792	27,436	109,744	82,391	128,536	210,927
1994	56	678	0	0	89,522	52,880	36,642	26,427	105,708	79,307	142,350	221,657
1995	58	718	26	30	62,598	51,723	10,875	19,357	77,426	71,079	88,301	159,380
1996[c]	64	1,164	25	46	137,925	127,645	10,280	29,230	116,921	156,875	127,201	284,076
1997	57	1,173	12	23	304,865	304,865	0	0	0	304,865	0	304,865
1998	45	340	18	23	33,515	33,515	0	16,723	66,893	50,238	66,893	117,131
1999	63	649	27	30	32,884	6,577	26,307	36,828	147,313	43,405	173,620	217,025
2000	64	1,163	26	31	89,857	76,500	13,357	22,516	90,062	99,016	103,419	202,435
2001	51	551	16	20	42,681	42,681	0	12,785	51,141	55,466	51,141	106,607
2002	53	1,001	12	25	85,086	76,767	8,319	13,677	54,706	90,443	63,026	153,469
2003	48	1,035	11	20	142,410	136,391	6,019	16,006	64,025	152,397	70,044	222,441
2004	42	763	2	10	150,399	143,161	7,238	12,029	48,117	155,190	55,355	210,545
2005	43	474	21	30	58,243	29,865	28,378	37,382	149,528	67,247	177,906	245,153
2006	24	102	13	15	0	0	0	15,503	62,010	15,503	62,010	77,513
2007 [d]	0	0	0	0	0	0	0	0	0	0	0	0
2008	27	299	1	3	31,669	31,669	0	0	0	31,669	0	31,669
2009	44	701	17	41	91,363	91,363	0	12,080	48,322	103,443	48,322	151,765
Average:												
1985-1991	47	440	28	56	54,248	54,248	0	22,260	88,776	76,507	88,776	165,283
1992-1995	59	702	21	32	84,824	65,189	19,635	23,406	93,623	88,594	113,258	201,852
2000-2009	40	609	12	20	69,171	62,840	6,331	14,198	56,791	77,037	63,122	146,686

-continued-

[a] From 1985 through 1991, the Chignik contribution was 80% of the sockeye salmon harvested in Beaver Bay, Balboa Bay, Southwest Stepovak, Stepovak Flats, and East Stepovak sections.

[b] From 1992 through 1995, the Chignik contribution was 80% of the sockeye salmon harvested in the Southeastern District Mainland fishery, except Orzinski Bay where 100% of the sockeye salmon are considered local production.

[c] Since 1996, the Chignik contribution is 80% of the sockeye harvested in Southeastern District Mainland fishery, except in the Northwest Stepovak Section where beginning July 1, 100% of the sockeye salmon are considered local.

[d] No fishery

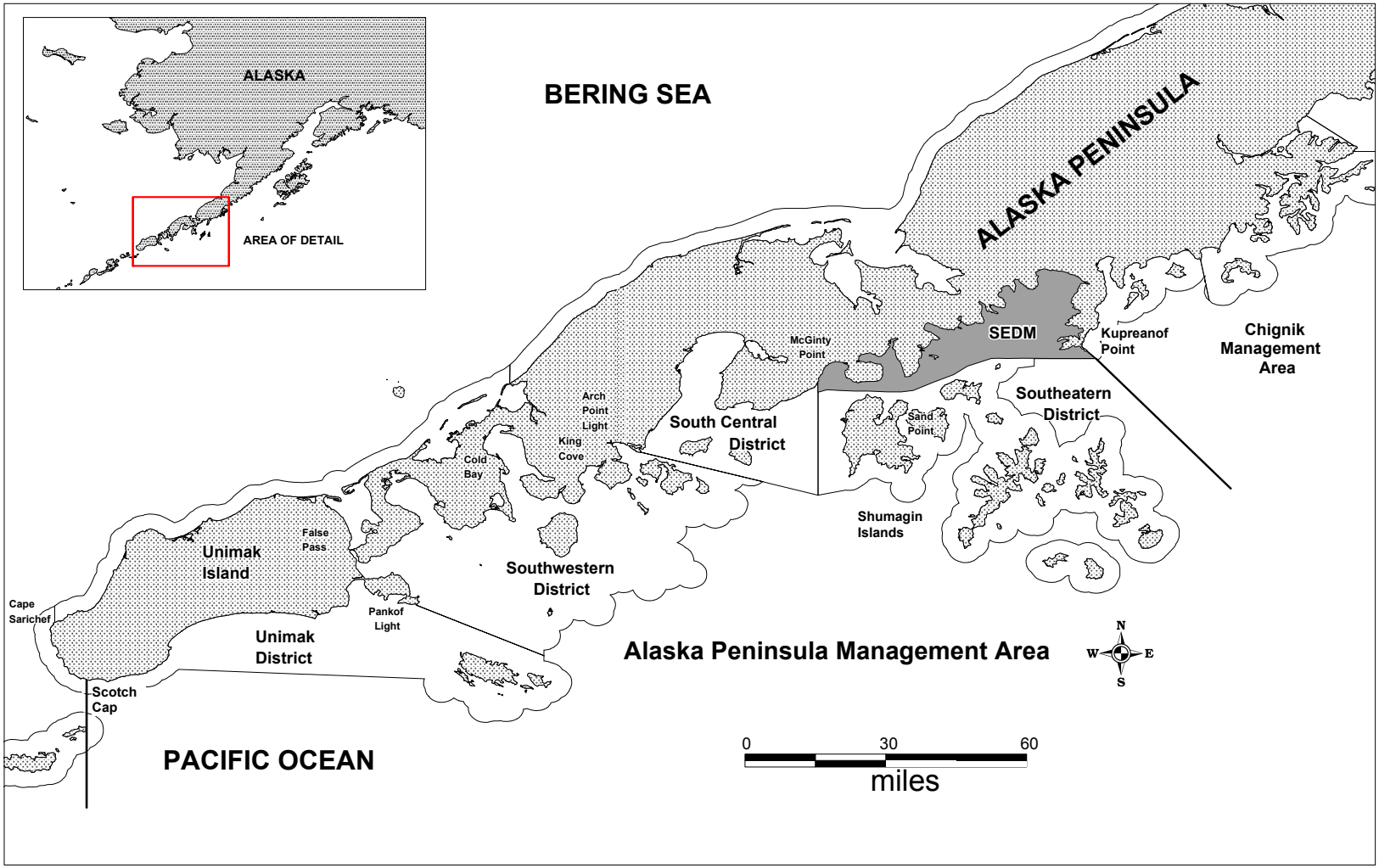

Figure 1.–Map of the South Alaska Peninsula Management Area with the Southeastern District Mainland (SEDM) defined.

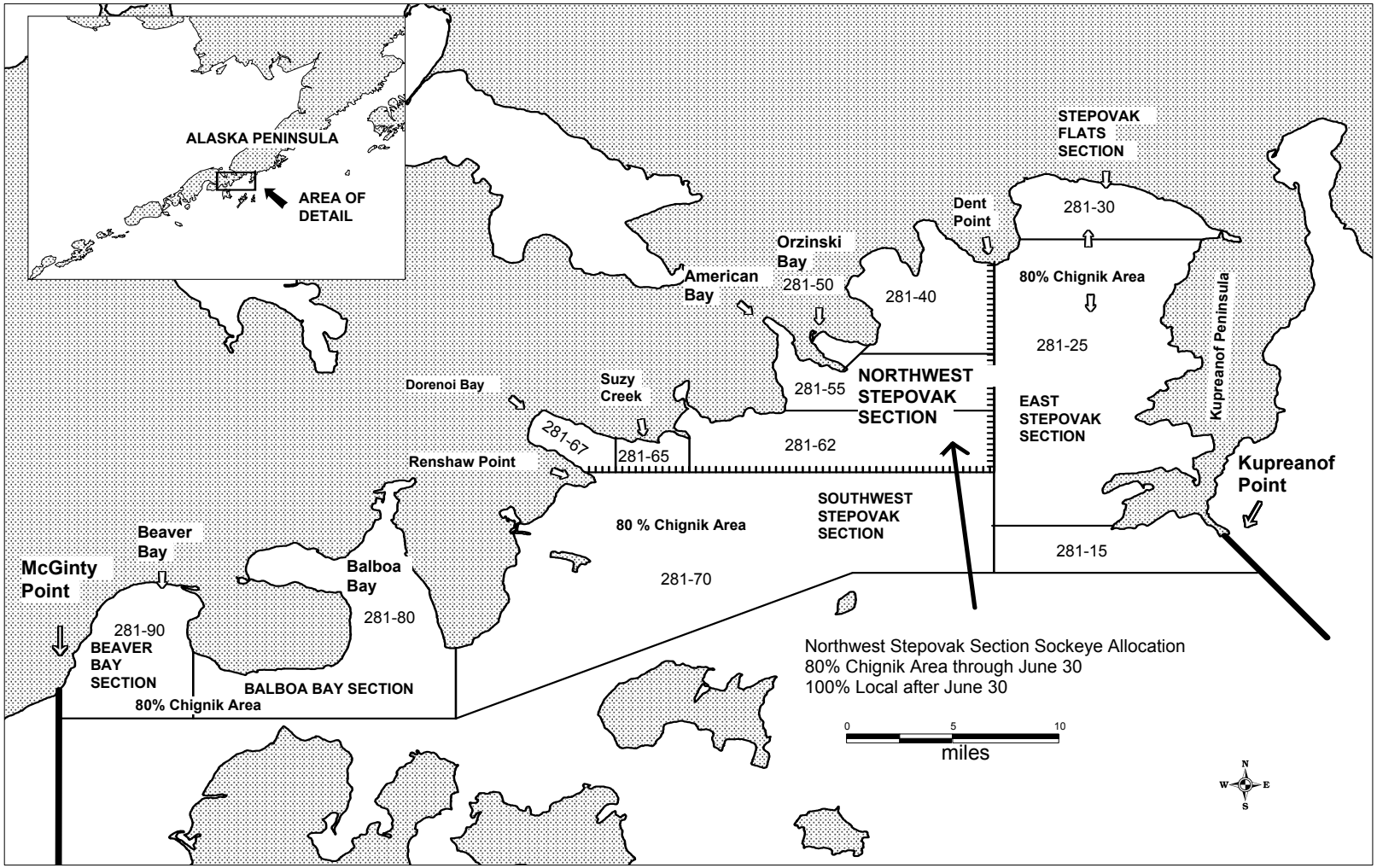

Figure 2.–Map of the Southeastern District Mainland from Kupreanof Point to McGinty Point with the salmon fishery sections defined.

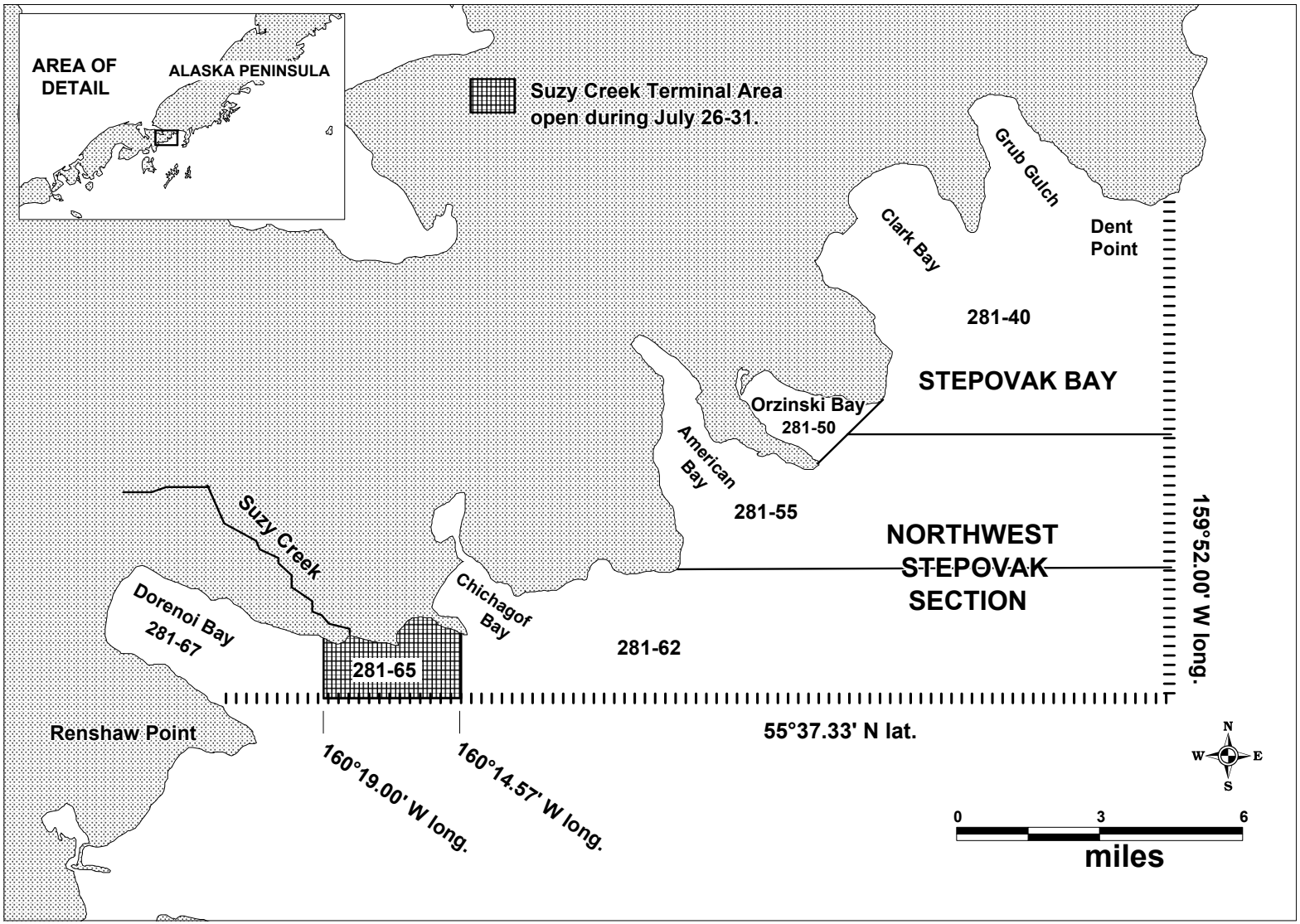

Figure 3.–Map of the Northwest Stepovak Section and the Suzy Creek terminal harvest area.

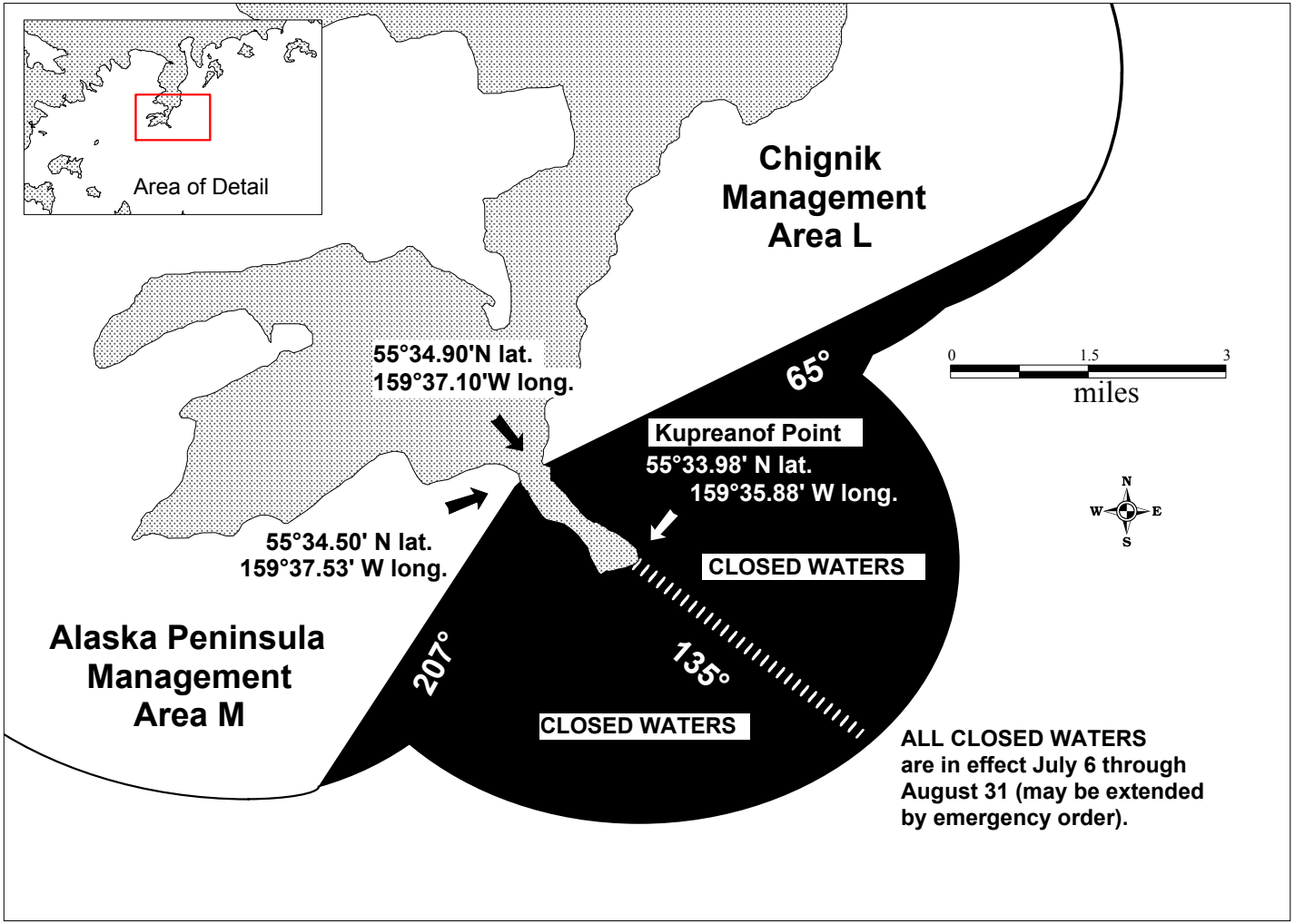

Figure 4.–Map of the Kupreanof Point area closed waters.

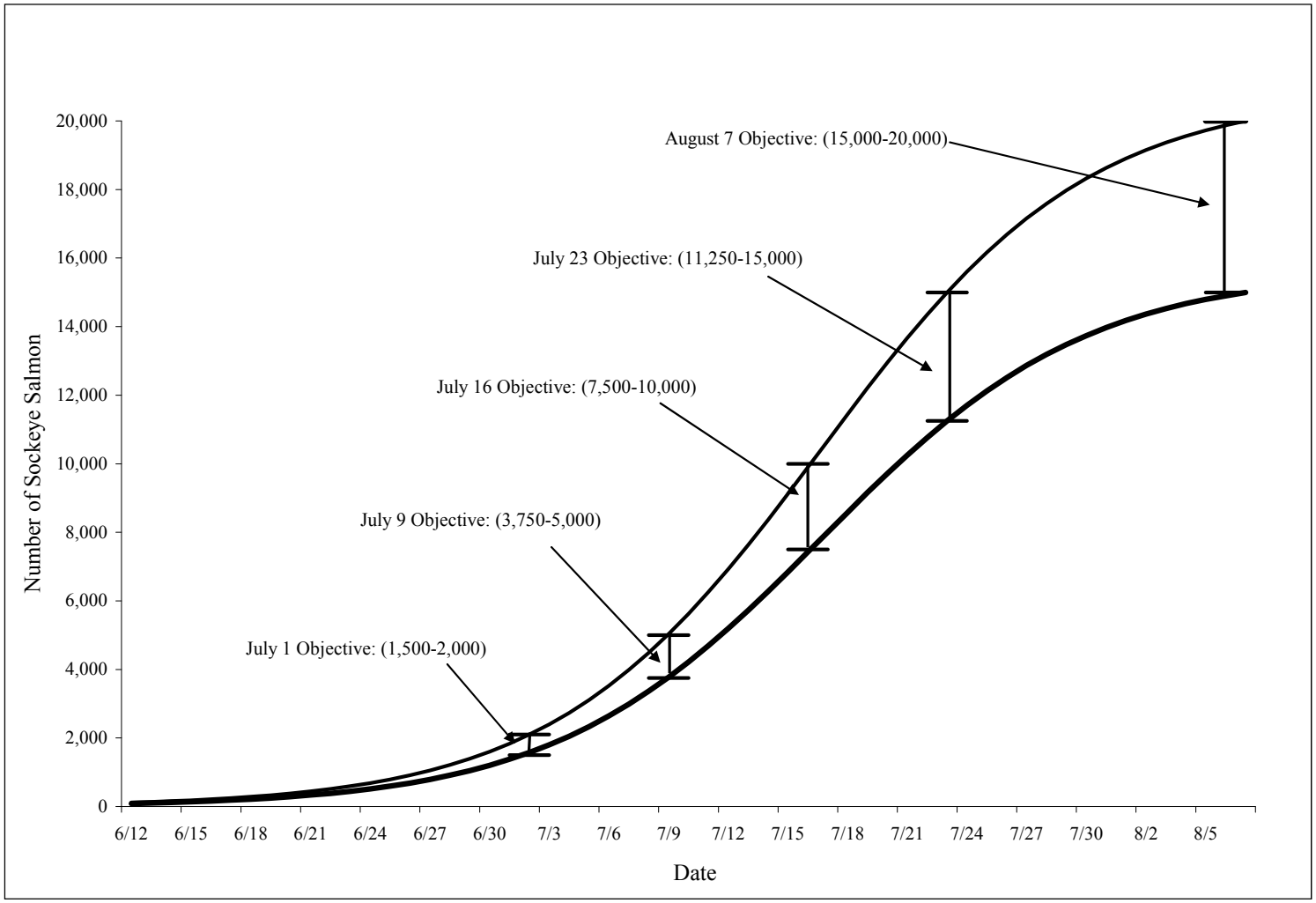

Figure 5.–Graph of the Orzinski Lake interim sockeye salmon escapement objectives by date.

APPENDIX A: SOUTHEASTERN DISTRICT MAINLAND SALMON REGULATIONS

5 AAC 09.360. SOUTHEASTERN DISTRICT MAINLAND SALMON MANAGEMENT PLAN. (a) The purpose of this management plan is to provide guidelines to the ADF&G for the management of the interception of Chignik River sockeye salmon caught in the Southeastern District Mainland fishery conducted in the East Stepovak, Stepovak Flats, Northwest Stepovak, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections. Except as specified in 5 AAC 09.330(f)(3), before July 11, only set gillnet gear may used in these sections. For the purpose of the management plan in this section, local runs include only those salmon in the waters

(1) beginning July 1, in the Northwest Stepovak Section described in 5 AAC 09.200(f);

(2) in the Stepovak Flats Section described in 5 AAC 09.200(f).

(b) In years when a harvestable surplus for the first (Black Lake) and second (Chignik Lake) runs of Chignik River system sockeye salmon is expected to be less than 600,000, a commercial salmon fishery is not allowed in the East Stepovak, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections, and in the Northwest Stepovak Section, excluding Orzinski Bay north of a line from Elephant Point at 55° 41.92' N. lat., 160° 03.20' W. long. to Waterfall Point at 55° 43.18' N. lat., 160° 01.13' W. long., until a harvest of 300,000 sockeye salmon is achieved in the Chignik Area described in 5 AAC 15.100. After July 8, if at least 300,000 sockeye salmon have been harvested in the Chignik Area, and if escapement goals are being met, ADF&G shall manage the fishery so that the number of sockeye salmon harvested in the Chignik Area will be at least 600,000 and the number of sockeye salmon, destined to the Chignik River, harvested in the East Stepovak, Stepovak Flats, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections, and before July 1, in the Northwest Stepovak Section, approaches as near as possible 7.6 percent of the sockeye salmon harvest in the Chignik Management Area.

(c) In years when a harvestable surplus beyond escapement goals for the first and second runs of Chignik River system sockeye salmon is expected to be more than 600,000 but the first run fails to develop as predicted and it is determined that a total sockeye salmon harvest in the Chignik Area of 600,000 or more might not be achieved, the commercial salmon fishery in the East Stepovak, Stepovak Flats, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections, and in the Northwest Stepovak Section, excluding Orzinski Bay north of a line from Elephant Point at 55° 41.92' N. lat., 160° 03.20' W. long. to Waterfall Point at 55° 43.18' N. lat., 160° 01.13' W. long., shall be curtailed in order to allow a harvest in the Chignik Area of at least 300,000 sockeye salmon through July 8 if that number of fish are determined to be surplus to the escapement goals of the Chignik River system. After July 8, if at least 300,000 sockeye salmon have been harvested in the Chignik Area, and if escapement goals are being met, ADF&G shall manage the fishery so that the number of sockeye salmon harvested in the Chignik Area is at least 600,000 and the number of sockeye salmon, destined to the Chignik River, harvested in the East Stepovak, Stepovak Flats, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections, and before July 1, in the Northwest Stepovak Section, approaches as near as possible 7.6 percent of the sockeye salmon harvest in the Chignik Management Area.

(d) In years when a harvestable surplus beyond the escapement goals for the first and second runs of Chignik River system sockeye salmon is expected to be more than 600,000 and ADF&G determines that the runs are as strong as expected, the department shall manage the fishery so that the number of sockeye salmon, destined to the Chignik River, taken in the East Stepovak, Stepovak Flats, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections, and before July 1, in the Northwest Stepovak Section, approaches as near as possible 7.6 percent of the sockeye salmon harvest in the Chignik Management Area.

-continued-

(e) Beginning July 1, in the Northwest Stepovak Section,

(1) the fishing schedule in the Northwest Stepovak Section, excluding Orzinski Bay north of a line from Elephant Point at 55° 41.92' N. lat., 160° 03.20' W. long. to Waterfall Point at 55° 43.18' N. lat., 160° 01.13' W. long. may not be more than four 24-hour periods with no more than 48-hours continuous fishing during a seven-day period.

(2) However, when the escapement through Orzinski weir exceeds 25,000 sockeye salmon, the commissioner may open the Northwest Stepovak Section, including Orzinski Bay concurrently; fishing periods will be as follows:

(A) set gillnet gear will operate continuously through 12:00 p.m. midnight July 25;

(B) purse seine and hand purse seine gear will operate as specified in (1) of this sub-section.

(f) The estimate of sockeye salmon destined for the Chignik River has been determined to be 80 percent of the sockeye salmon harvested in the East Stepovak, Stepovak Flats, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections, and before July 1 in the Northwest Stepovak Section. Beginning July 1, all sockeye salmon taken in the Northwest Stepovak Section are considered to be destined for Orzinski Bay.

(g) The percentage of sockeye salmon, destined to the Chignik River, harvested in the Southeastern District Mainland fishery may be permitted to fluctuate above or below 7.6 percent of the sockeye salmon harvest in the Chignik Management Area at any time before July 25.

(h) The allocation method described in (a) - (g) of this section is in effect through July 25. The commissioner may not open the first fishing period of the commercial salmon fishing season in the East Stepovak, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections, and before July 1 in the Northwest Stepovak Section, before the first fishing period of the commercial salmon fishing season in the Chignik Area. After July 25, the commissioner may open, by emergency order, commercial salmon fishing in the entire Southeastern District Mainland area for local stocks.

(i) During the period from approximately June 26 through July 8, the strength of the second run of the Chignik River system sockeye salmon cannot be evaluated. In order to prevent overharvest of the second run, ADF&G may disallow or severely restrict commercial salmon fishing in the East Stepovak, Stepovak Flats, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections during this period, and from June 26 through June 30 in the Northwest Stepovak Section.

(j) The commissioner shall open all commercial fishing periods by emergency order. Before commencement of the first commercial salmon fishing period of the season, the department shall give at least 24 hours' notice. For subsequent fishing periods, the department shall give at least 12 hours' notice. If an existing fishing period is extended, the department shall give notice of the extension as soon as possible before the end of the existing fishing period.

(k) Notwithstanding any other provision of this section, from July 1 through July 10, if the department determines that the Orzinski Lake sockeye salmon escapement objectives have been exceeded, in addition to set gillnet gear, the commissioner may open, by emergency order, the waters of Orzinski Bay west of 160º 04.25' W. long. to fishing with purse seine and hand purse seine gear.

(*l*) From July 26 through October 31,

(1) the department shall manage the fishery based on the abundance of local pink, chum, and coho salmon stocks;

(2) there shall be at least one 36-hour closed period within a seven-day period.

APPENDIX B: 2009 CHIGNIK MANAGEMENT AREA SOCKEYE SALMON FORECAST

Forecast Area: Chignik
Species: Sockeye Salmon

Preliminary Forecast of the 2010 Run

Total Production		Forecast Estimate (thousands)	Forecast Range (thousands)
Early Run (Black Lake)	Total Run Estimate	1,080	373–1,790
	Escapement Goal	350	350–400
	Harvest Estimate[a]	730	
Late Run (Chignik Lake)	Total Run Estimate	1,110	646–1,570
	Escapement Objective[b]	250	250–400
	Harvest Estimate[a]	857	
Total Chignik System	Total Run Estimate	2,190	1,019–3,360
	Escapement Objective[b]	600	600–800
	Harvest Estimate[a]	1,590	

Note: Column numbers may not total or correspond exactly with numbers in text due to rounding.

[a] These figures include harvests of Chignik-bound sockeye salmon from the Southeastern District Mainland and the Cape Igvak fisheries; approximately 1.3 million sockeye salmon are projected to be harvested in the Chignik Management Area.

[b] The Chignik Lake late-run escapement goal is 200,000–400,000, resulting in an escapement goal for the entire run of 550,000–800,000. However, managers try to achieve an additional inriver run goal of 50,000 in August and September.

Forecast Methods

The forecasts for the 2010 early and late Chignik sockeye salmon runs were based on available data from 1977 to the present. Simple linear regressions were modeled using recent outmigration year saltwater age class relationships. Each regression model was assessed with standard regression diagnostic procedures. Regression estimates were only used in cases where the slope of the regression was significantly different from zero ($P < 0.25$). The variance of each estimate was calculated from the error structure of the regression. Regression analyses were examined for serial autocorrelation.

The predicted 2010 early-run age-.3 (ages 0.3, 1.3, 2.3, 3.3, and 4.3) sockeye returns were estimated based on the abundance of prior age-.2 (ages 0.2, 1.2, 2.2, and 3.2; $R^2 = 0.55$; $P = 1.6 \times 10^{-5}$). Following non-significant regression results, the early-run age-.1 (ages 0.1, 1.1, 2.1 and 3.1), age-.2 (ages 0.2, 1.2, 2.2, and 3.2), age-.4 (ages 0.4, 1.4, 2.4, and 3.4), and age-.5 (age-1.5 and age-2.5 fish) components were predicted by calculating the median returns since 1981 outmigration year. Saltwater age class and cumulative precipitation relationships were analyzed for the late-run forecast. The age-.2 sockeye salmon were predicted from prior year's age-.1 returns using simple linear regression, ($R^2 = 0.42$; $P = 2.6 \times 10^{-4}$). Returns of age-.3 sockeye salmon were predicted from an index of total cumulative winter precipitation. The age-.3 sockeye returns were negatively correlated with winter precipitation ($R^2 = 0.27$; $P = 0.02$).

-continued-

The summation of precipitation data from October through April of the winter prior to the outmigration year were obtained from the Cold Bay Airport climate database. The age-.4 sockeye salmon were predicted from age-.3 returns using simple linear regression ($R^2 = 0.13$; $P = 0.08$). The age-.1 and age-.5 sockeye age classes were predicted by calculating the median returns.

The variances associated with individual regression estimates by age class were used to calculate 80% prediction intervals for those estimates. Prediction intervals were re-estimated utilizing the standard error from a regression of the residuals when serial autocorrelation was detected. Prediction intervals for median estimates were calculated using the 10th and 90th percentiles of the returns. For each run (early and late), the overall 80% prediction intervals were calculated as the square root of the sum of the squared 80% prediction intervals for each forecasted age class. The early- and late-run regression and median estimates were summed to estimate the total Chignik watershed sockeye salmon run for 2010. The combined early- and late-run 80% prediction interval was calculated by summing the lower prediction bounds and upper prediction bounds of the 2 runs.

Forecast Discussion

The 2010 sockeye salmon run to the Chignik River is expected to be approximately 2.19 million. The early run is expected to be approximately 1.08 million. The late run is expected to be approximately 1.11 million. The 2010 Chignik sockeye salmon run is expected to be approximately 158,000 more than the recent 10-year average run (2.03 million) and 90,000 more than the 2009 run (2.10 million).

The projected harvest estimate for the early run of 730,000 is based on achievement of the lower end of the early-run escapement goal range of 350,000. The projected harvest estimate for the late run of 857,000 is based on achievement of the lower end of the late-run inriver run goal range through September 15 (250,000). Harvest estimates for the both runs include Chignik-bound sockeye salmon harvested in the Cape Igvak Section of the Kodiak Management Area and the Southeastern District Mainland of the Alaska Peninsula Management Area.

Available smolt data were analyzed and a significant simple linear regression relationship ($R^2 = 0.62$; $P = 0.002$) was found using the number of outmigrating age-2. smolt to predict the subsequent age-.3 adult returns (about 82% of the run). This estimate was then expanded proportionally to account for other ages (age-.1, -.2, -.4, and age-.5). The smolt-based forecast of the 2010 Chignik total sockeye salmon run is 1.54 million, which is less (700,000) than that predicted from ocean-age relationships and median estimates (2.19 million).

The smolt forecast approximates the median and ocean-age class forecasts. Given this ancillary information, our confidence in this forecast is fair.

Heather Finkle, Finfish Research Biologist, Alaska Peninsula